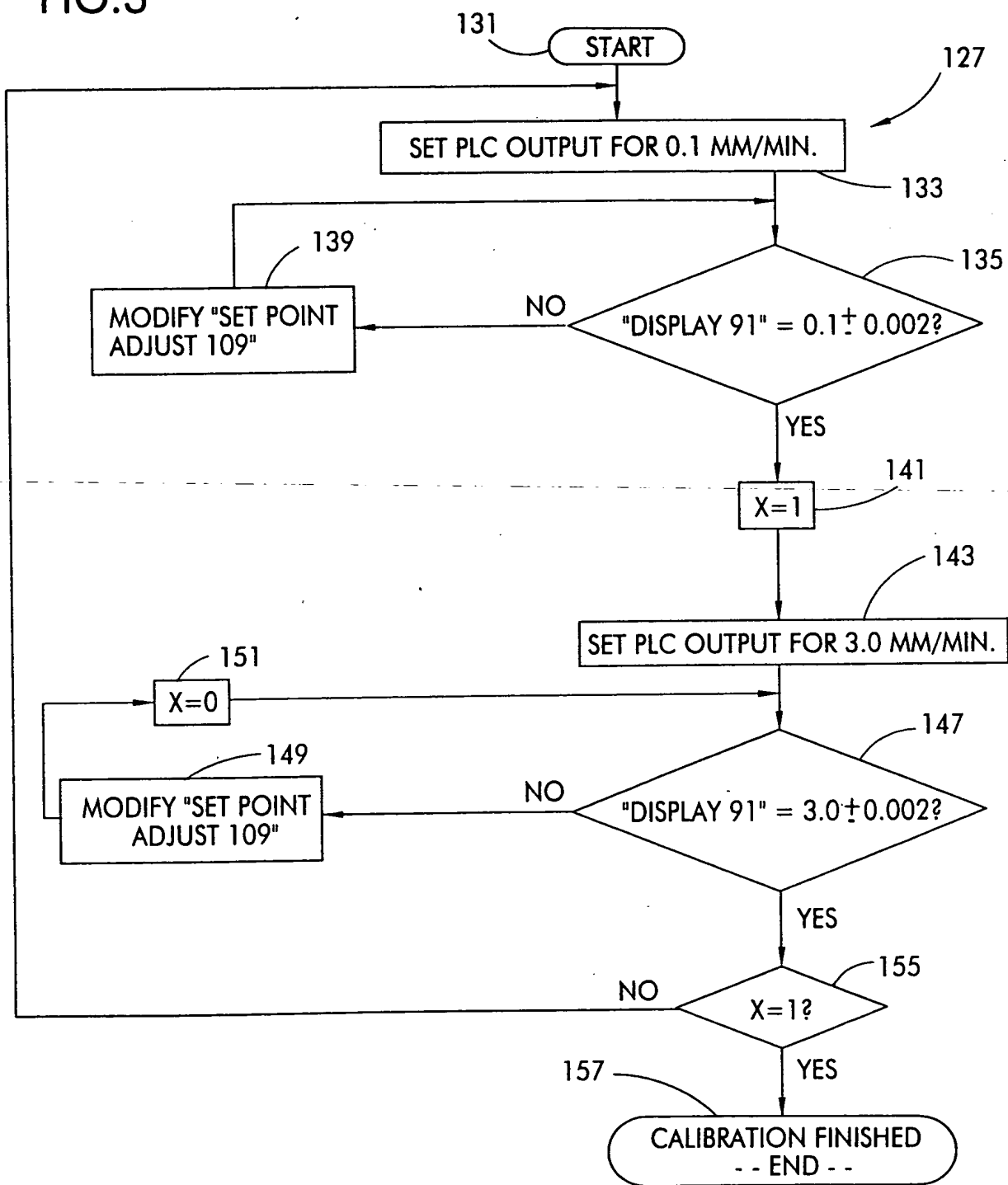


FIG. 2 is a block diagram of a control system for a seed crystal growth apparatus. The system includes a PLC (Programmable Logic Controller) with a CPU and MEMORY. The PLC is connected to a SET POINT ADJUST (109) and a SIGNAL COND. (123). The SET POINT ADJUST is connected to the PLC via lines 117 and 119. The SIGNAL COND. is connected to the PLC via lines 111 and 113. The PLC is connected to a SERVO AMP (93) via lines 101, 103, 105, and 107. The SERVO AMP is connected to a MOTOR (53) via lines 95 and 97. The MOTOR is connected to a shaft (55) which is connected to a pulley (43). The pulley is connected to a belt (37) which is connected to a seed crystal (41). The seed crystal is connected to a TO SEED CRYSTAL output. The PLC is also connected to a DISPLAY (91) and a DISPLAY (125) via lines 71 and 73. The PLC is connected to a MOTOR (53) via lines 59 and 63. The MOTOR is connected to a shaft (55) which is connected to a pulley (43). The pulley is connected to a belt (37) which is connected to a seed crystal (41). The seed crystal is connected to a TO SEED CRYSTAL output.

The block diagram illustrates a closed-loop control system for a motor. The components and their interconnections are as follows:

- SET POINT PROFILE (173)**: Provides the initial set point to the **CALCULATE MODIFIED SET POINT (175)** block.
- CALCULATE MODIFIED SET POINT (175)**: Receives feedback from the **500 PPR ENCODER (77)** and the **SERVO AMP (93)**. It outputs a modified set point to the **SET POINT ADJUST (109)** block.
- SET POINT ADJUST (109)**: Outputs a signal to the **SERVO AMP (93)**.
- SERVO AMP (93)**: Drives the **MOTOR (53)**.
- MOTOR (53)**: The output of the system, which is monitored by the **500 PPR ENCODER (77)**.
- 500 PPR ENCODER (77)**: Provides position feedback to the **CORRECTION FACTOR (169)** and the **CALCULATE MODIFIED SET POINT (175)** block.
- CORRECTION FACTOR (169)**: Receives feedback from the **500 PPR ENCODER (77)** and the **SERVO AMP (93)**. It outputs a correction signal to the **CALCULATE MODIFIED SET POINT (175)** block.
- MEMORY (73)**: Stores data and provides input to the **CORRECTION FACTOR (169)** block.
- Feedback Loop (165)**: A dashed line indicating the overall feedback path from the motor back to the control logic.

FIG.3



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FIG. 4

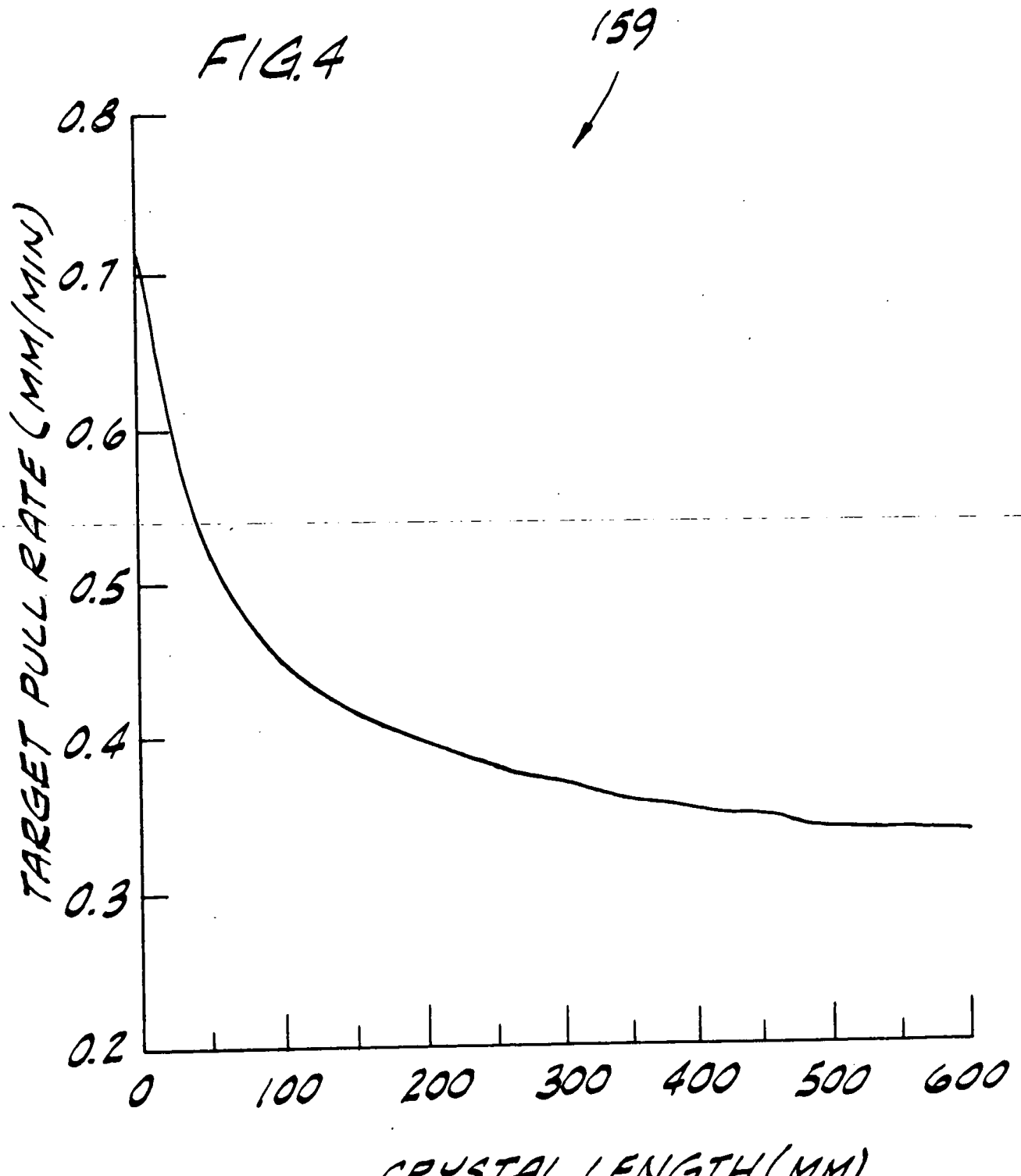


FIG.6A

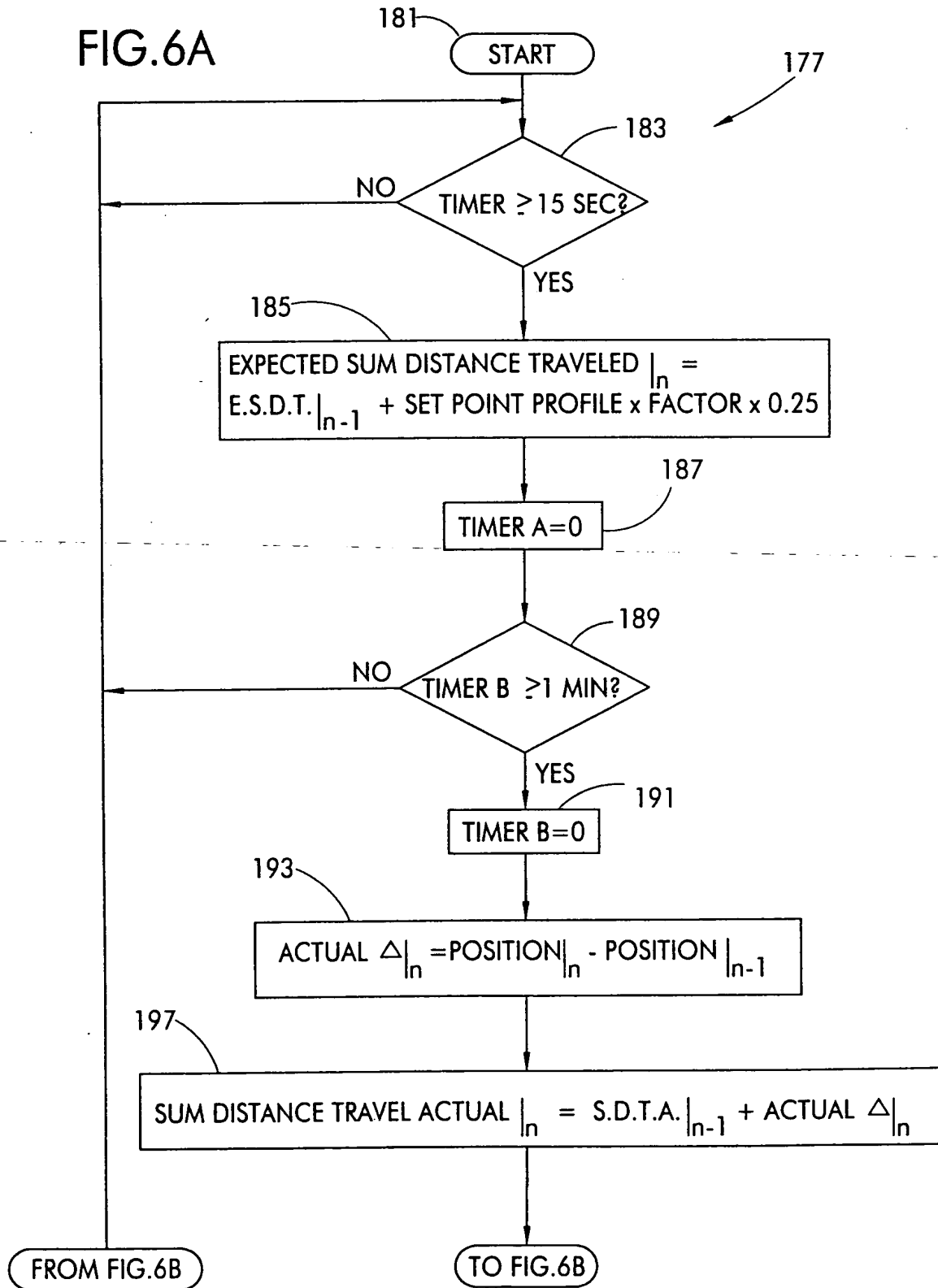
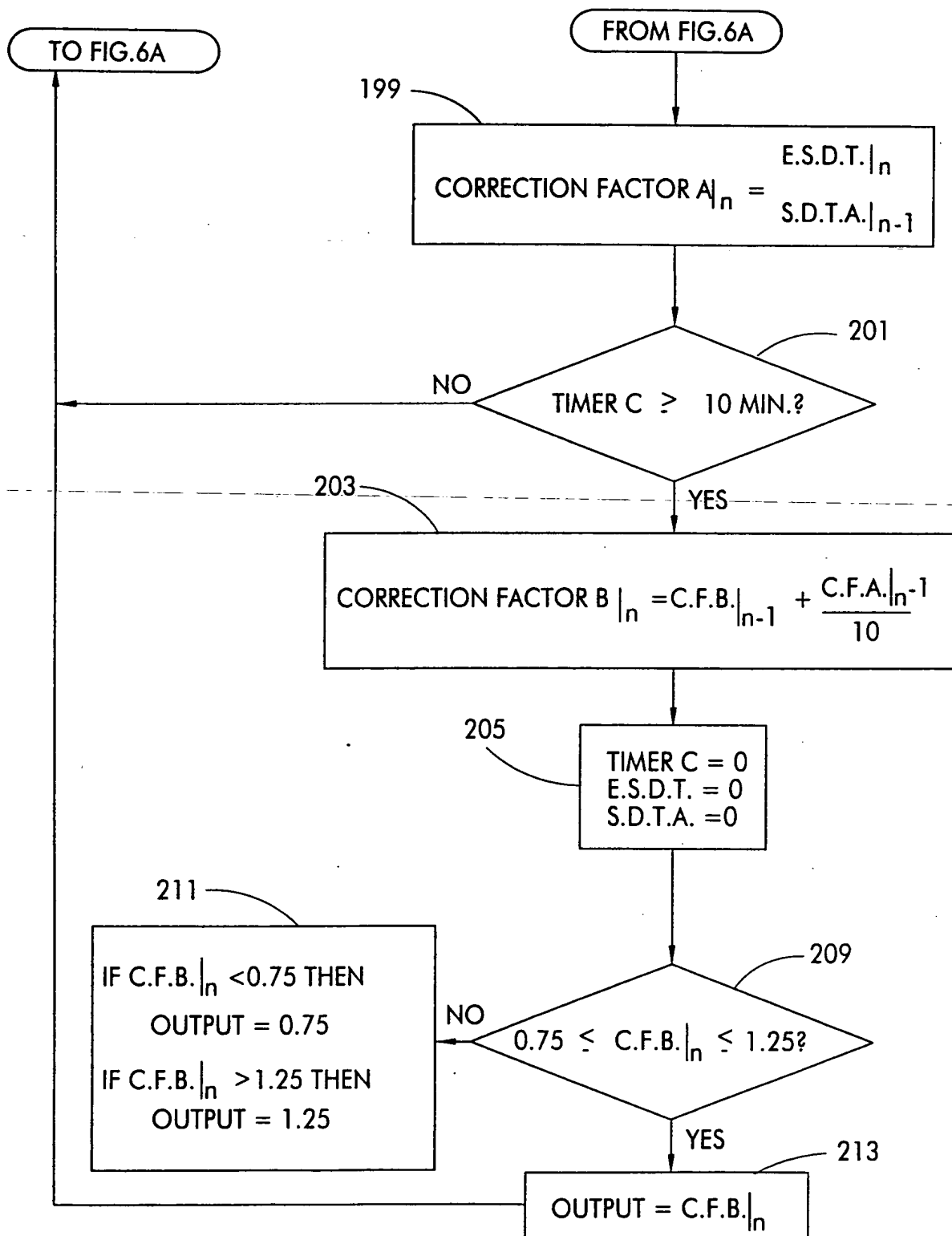
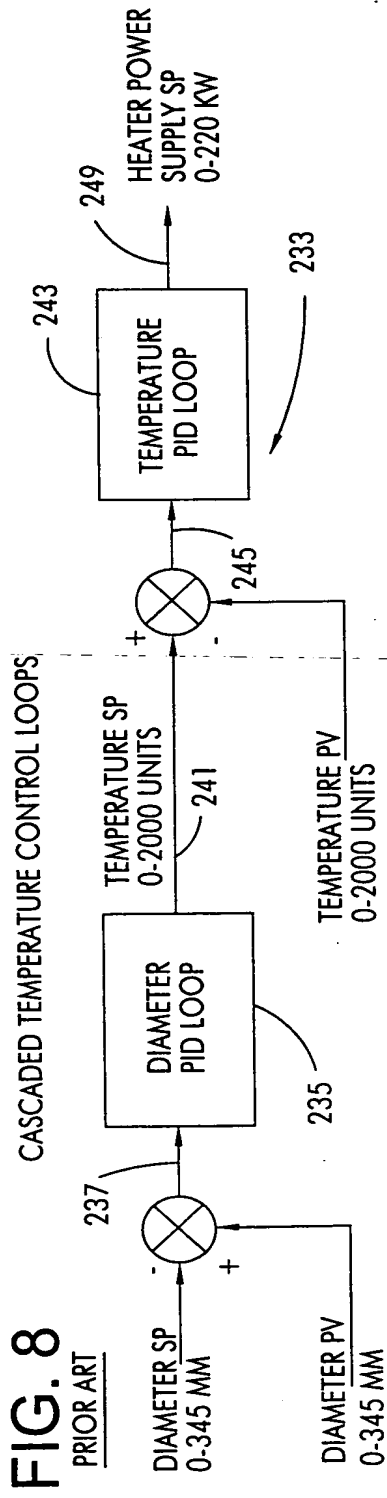
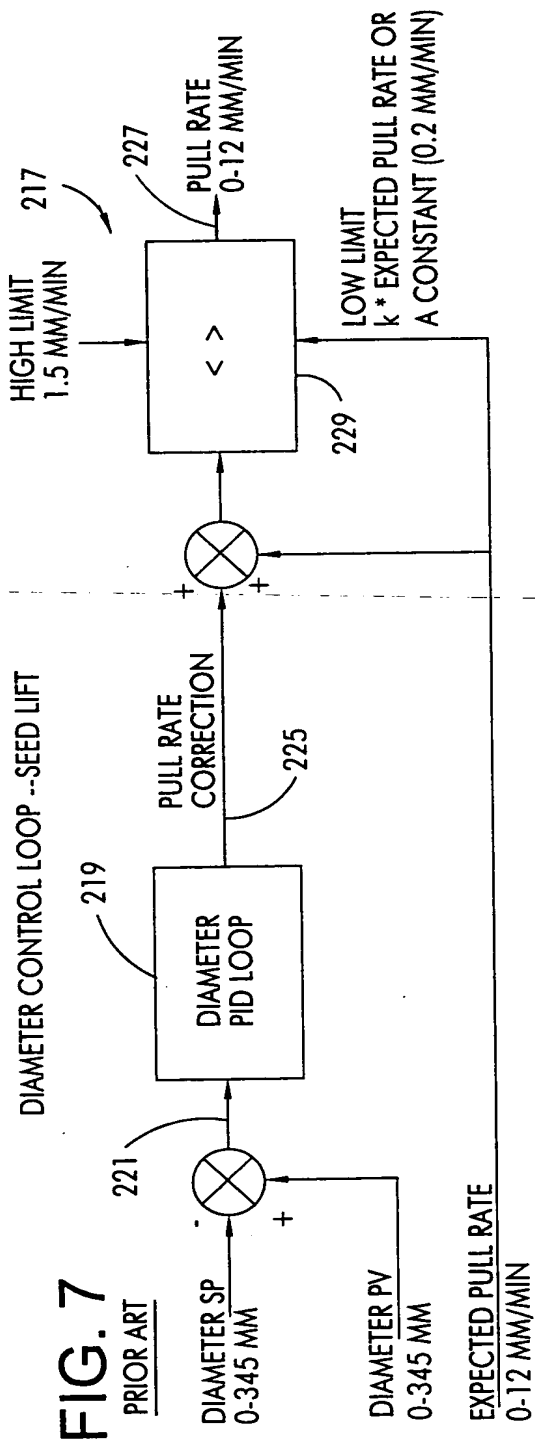


FIG. 6B





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FIG. 9

PRIOR ART

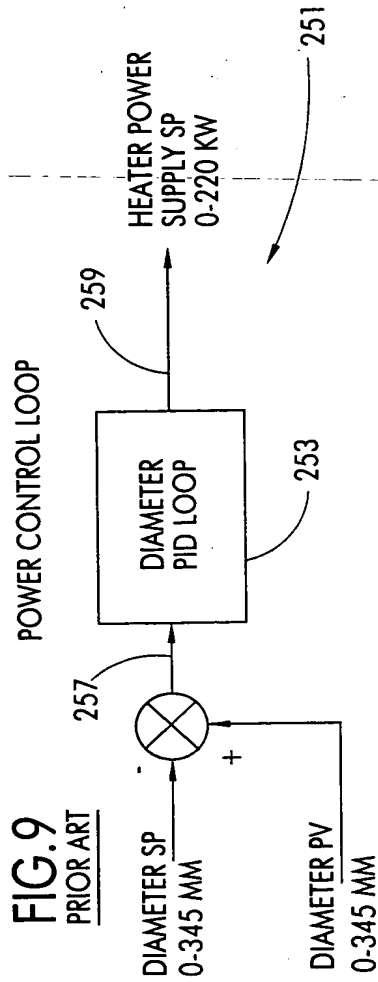
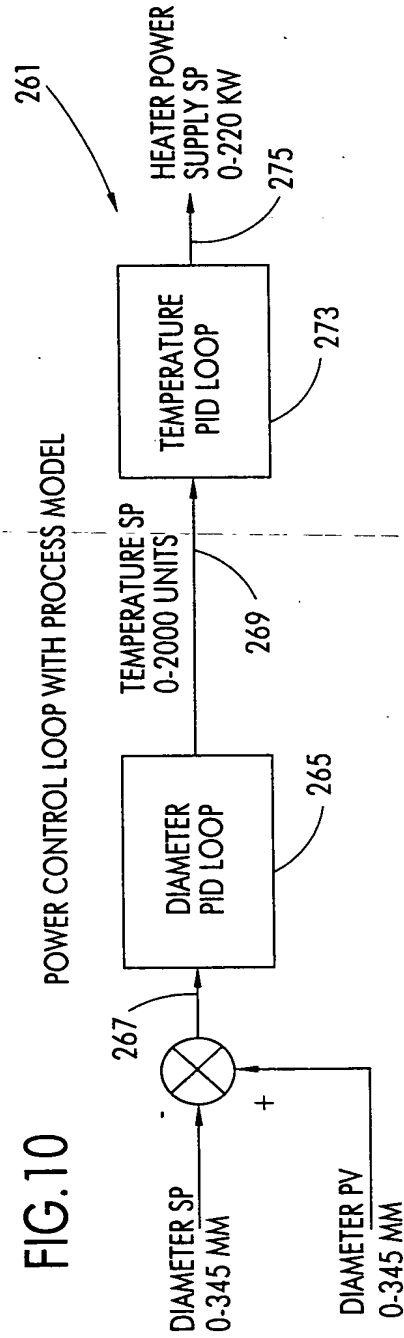


FIG. 10

POWER CONTROL LOOP WITH PROCESS MODEL



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FIG.11

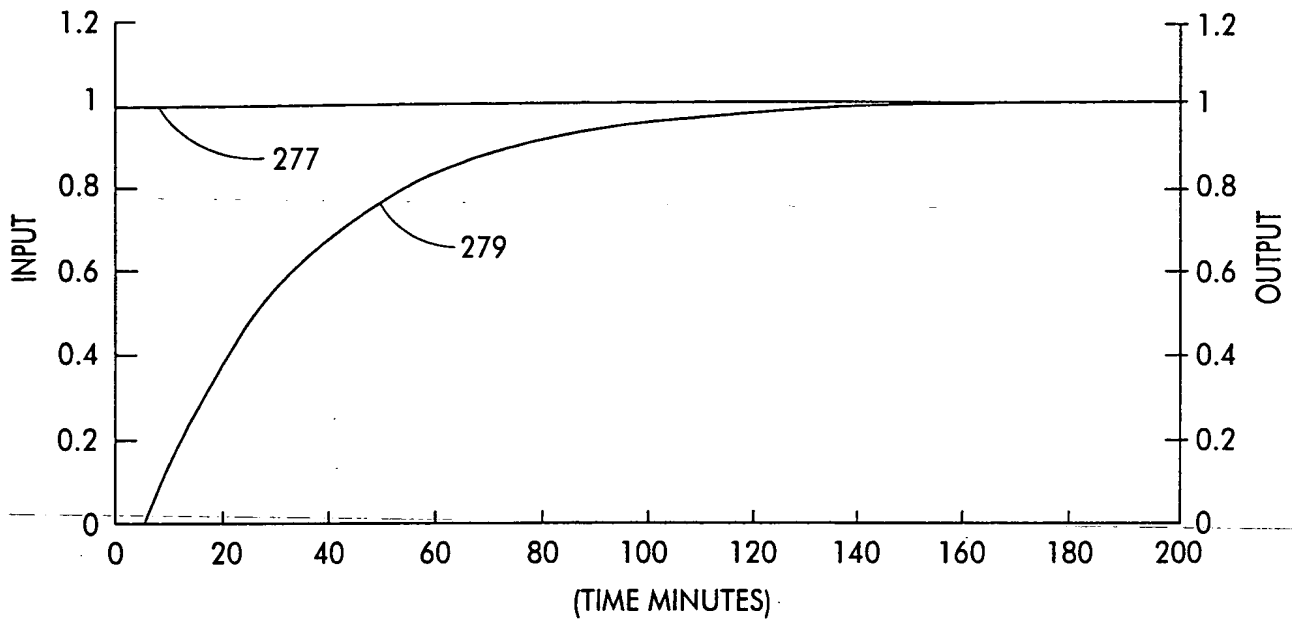
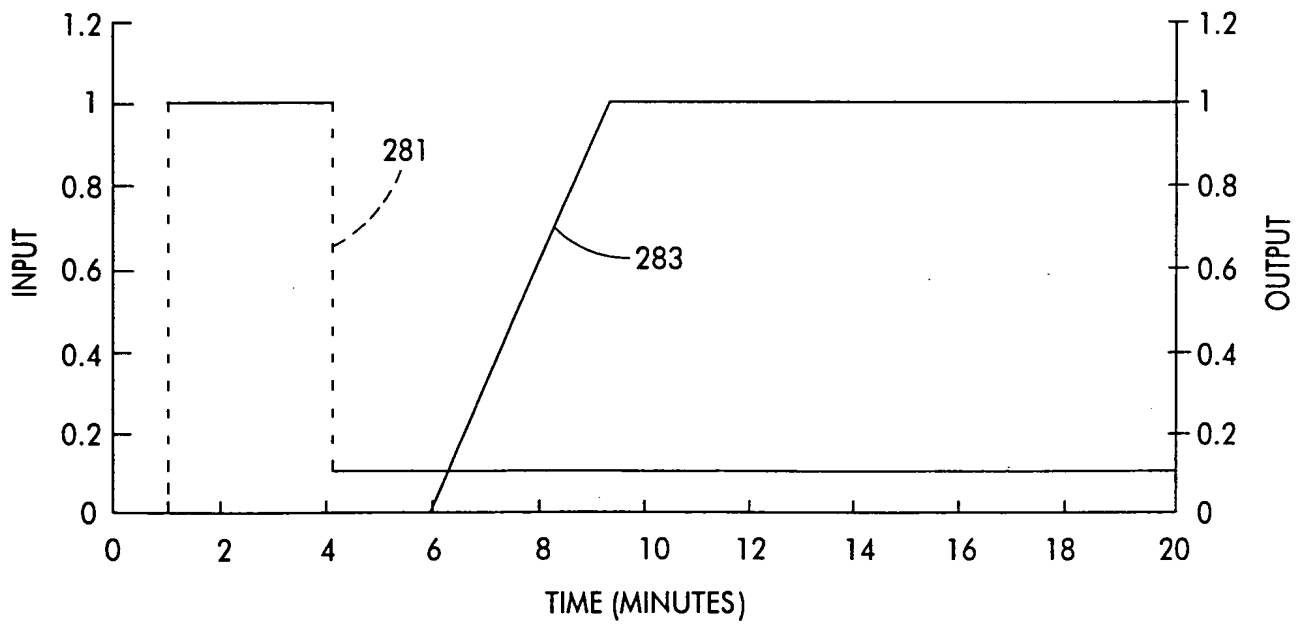


FIG.12



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FIG. 13

